

REMARKS

Rejection Under 35 U.S.C. §103(a)

The Examiner rejected claims 1-4, 6-9, and 12-29 under 35 U.S.C. §103(a) as being unpatentable over Patel (U.S. Patent No. 5,396,403) in view of Hamilton (U.S. Patent No. 5,841,244).

Patel recites "a plurality of integrated circuit chips 13 mounted on a first surface 15 of the substrate by means of solder bumps 17" (col. 4, lines 46-48). Patel further recites "FIG. 4 illustrates ... substrate 61 that has one or more chips 63 on an upper surface 65 and more chips 67 on a lower surface 69" (col. 6, lines 5-8). Hamilton recites "heat sink comprising a plurality of ... microchannels ... acts as conduits for a cooling fluid" (emphasis added) (col. 5, lines 11-13).

Claim 1 recites "a cooling fluid in contact with the active surface" (emphasis added). Twice amended claim 8 recites "cooling fluid contacts the active region" (emphasis added). Claim 12 recites "cooling fluid across an active surface of the integrated circuit die" (emphasis added). Amended claim 17 recites "the cooling fluid contacts the active surface" (emphasis added). Claim 27 recites "in contact with the active region of the integrated circuit die" (emphasis added). Patel in combination with Hamilton do not teach or suggest the cited portions of claims 1, 12, and 27 and amended claims 8 and 17. Applicants respectfully submit that claims 1, 12, and 27 and amended claims 8 and 17 are allowable over the teachings and suggestions of Patel in combination with Hamilton for at least the reason provided above. Accordingly,

Applicants request the Examiner to allow claims 1, 12, and 27 and amended claims 8 and 17.

Applicants request allowance of claims 2-4 and 6-7 for at least the same reasons as pertain to claim 1. Applicants request allowance of claim 9 for at least the same reasons as pertain to claim 8. Applicants request allowance of claims 13-16 for at least the same reasons as pertain to claim 12. Applicants request allowance of claims 18-26 for at least the same reasons as pertain to base claim 17. Applicants request allowance of claims 28-29 for at least the same reasons as pertain to base claim 27.

The Examiner rejected claim 5 under 35 U.S.C. §103(a) as being unpatentable over Patel in view of Hamilton and further in view of Lin et al. (U.S. Patent No. 6,188,578). Claim 5 depends from base claim 1. Lin does not cure the deficiencies of Patel and Hamilton with regards to the cited portion of claim 1. Applicants respectfully submit that claim 5 is allowable over the teachings and suggestions of Patel in view of Lin and Hamilton for at least the same reasons as pertain to claim 1.

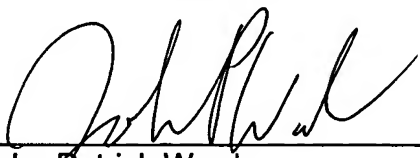
Accordingly, applicants respectfully request the Examiner to allow pending claims 1-29. If the Examiner has any questions concerning this application, please call the applicants' attorney at (212) 661-5488.

If there are any additional charges, please charge Deposit Account No. 02-2666.

Respectfully submitted,

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Date: 2/12, 2003



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I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail with sufficient postage in an envelope addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231

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Date of Deposit
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Signature Date



**VERSION OF AMENDED CLAIMS WITH
MARKINGS TO SHOW CHANGES MADE**

8. (Twice Amended) A method of forming an integrated circuit package comprising:
- attaching an interposer to a package substrate;
 - attaching an integrated circuit die to the interposer, wherein the integrated circuit die includes an active region;
 - covering the package substrate, the integrated circuit die, and the interposer with a heat spreader to form an internal chamber;
 - filling the internal chamber with a cooling fluid, wherein the cooling fluid contacts a region between the interposer and the integrated circuit die and wherein the cooling fluid contacts the active region.
17. (Amended) An integrated circuit package comprising:
- a package substrate;
 - a first integrated circuit die having an active surface;
 - an interposer disposed between the package substrate and the first integrated circuit die, the interposer establishing electrical connectivity between the first integrated circuit die and the package substrate; and
 - a cooling fluid disposed between the first integrated circuit die and the interposer, wherein the cooling fluid contacts the active surface.